

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings of claims in the application:

**Listing of Claims:**

- 1                   1.       (Currently amended) A method of diagnosing the presence or severity of  
2 liver fibrosis in an individual, comprising the steps of:  
3                   (a) detecting  $\alpha$ 2-macroglobulin ( $\alpha$ 2-MG) in a sample from said individual;  
4                   (b) detecting hyaluronic acid (HA) in a sample from said individual;  
5                   (c) detecting tissue inhibitor of metalloproteinases-1 (TIMP-1) in a sample from  
6 said individual; and  
7                   (d) diagnosing the presence or severity of liver fibrosis in said individual based on  
8 the presence or level of  $\alpha$ 2-MG, HA and TIMP-1.
- 1                   2.       (Original) The method of claim 1, comprising detecting at most three  
2 markers of fibrosis.
- 1                   3.       (Original) The method of claim 1, further comprising detecting in a  
2 sample from said individual at least one marker selected from the group consisting of: PIIINP,  
3 laminin, tenascin, collagen type IV, collagen type VI, YKL-40, MMP-3, MMP-2, MMP-  
4 9/TIMP-1 complex, sFas ligand, TGF- $\beta$ 1, IL-10, apoA1, apoA2, and apoB.
- 1                   4.       (Original) The method of claim 3, wherein said marker is YKL-40.
- 1                   5.       (Currently amended) The method of claim 1, further comprising detecting  
2 in a sample from said individual two or more markers selected from the group consisting of  
3 PIIINP, laminin, tenascin, collagen type IV, collagen type VI, YKL-40, MMP-3, MMP-2, MMP-  
4 9/TIMP-1 complex, sFas ligand, TGF- $\beta$ 1, IL-10, ~~apoA2~~ apoA1, apoA2 and apoB.
- 1                   6.       (Original) The method of claim 1, wherein said individual has viral  
2 hepatitis.

1                   7.       (Currently amended) The method of claim ~~7~~ 6, wherein said individual is  
2 infected with hepatitis C virus.

1                   8.       (Currently amended) The method of claim ~~7~~ 6, wherein said individual is  
2 infected with hepatitis B virus.

1                   9.       (Original) The method of claim 1, wherein said individual has  
2 autoimmune liver disease.

1                   10.     (Original) The method of claim 1, wherein said individual has alcoholic  
2 liver disease.

1                   11.     (Original) The method of claim 1, wherein said individual has a fatty liver  
2 disease.

1                   12.     (Original) The method of claim 1, wherein said individual has drug-  
2 induced liver disease.

1                   13.     (Original) The method of claim 1, wherein step (a) comprises determining  
2 the level of  $\alpha 2$ -MG protein in said sample.

1                   14.     (Canceled)

1                   15.     (Currently amended) The method of claim ~~14~~ 13, wherein the level of  $\alpha 2$ -  
2 MG protein is determined using one or more anti- $\alpha 2$ -MG antibodies.

1                   16.     (Original) The method of claim 1, wherein step (a) comprises determining  
2 a level of  $\alpha 2$ -MG activity.

1                   17.     (Original) The method of claim 1, wherein step (b) comprises determining  
2 the level of HA in said sample.

1                   18.     (Canceled)

1                   19.     (Currently amended) The method of claim ~~18~~ 17, wherein the level of HA  
2 is determined using one or more HA-binding proteins.

1                   20.     (Currently amended) The method of claim ~~18~~ 17, wherein the level of HA  
2 is determined using one or more anti-HA antibodies.

1                   21.     (Original) The method of claim 1, wherein step (c) comprises determining  
2 the level of TIMP-1 protein in said sample.

1                   22.     (Canceled)

1                   23.     (Currently amended) The method of claim ~~22~~ 21, wherein the level of  
2 TIMP-1 protein is determined using one or more anti-TIMP-1 antibodies.

1                   24.     (Original) The method of claim 1, wherein step (c) comprises determining  
2 a level of TIMP-1 activity.

1                   25.     (Original) The method of claim 1,  
2 wherein step (a) comprises determining the level of  $\alpha$ 2-MG protein,  
3 wherein step (b) comprises determining the level of HA, and  
4 wherein step (c) comprises determining the level of TIMP-1 protein.

1                   26.     (Original) The method of claim 25, wherein the level of  $\alpha$ 2-MG protein,  
2 HA and TIMP-1 protein each is determined using an enzyme-linked assay.

1                   27.     (Original) The method of claim 1, wherein a single sample is obtained  
2 from said individual.

1                   28.     (Original) The method of claim 27, wherein said sample is selected from  
2 the group consisting of blood, serum, plasma, urine, saliva and liver tissue.

1                   29.     (Original) The method of claim 28, wherein said sample is a serum  
2 sample.

1                   30.     (Currently amended) The method of claim 1, comprising differentiating  
2 ~~no or mild liver fibrosis from moderate to severe liver fibrosis~~ F0-F1 fibrosis from F2-F4  
3 fibrosis.

1                   31.     (Currently amended) A method of differentiating ~~no or mild liver~~  
2 ~~fibrosis from moderate to severe liver fibrosis~~ F0-F1 fibrosis from F2-F4 fibrosis in an  
3 individual, comprising the steps of:

4                   (a1) (a) contacting an appropriate dilution of a sample from said individual with  
5 anti- $\alpha$ 2-MG antibody under conditions suitable to form a first complex of  $\alpha$ 2-MG and anti- $\alpha$ 2-  
6 MG antibody;

7                   (b) washing said first complex to remove unbound molecules;

8                   (c) determining the amount of  $\alpha$ 2-MG-containing first complex;

9                   (d) contacting an appropriate dilution of a sample from said individual with a HA-  
10 binding protein (HABP) under conditions suitable to form a second complex of HA and HABP;

11                   (e) washing said second complex to remove unbound molecules;

12                   (f) determining the amount of HA-containing second complex;

13                   (g) contacting an appropriate dilution of a sample from said individual with anti-  
14 TIMP-1 antibody under conditions suitable to form a third complex of TIMP-1 and anti-TIMP-1  
15 antibody;

16                   (h) washing said third complex to remove unbound molecules;

17                   (i) determining the amount of TIMP-1-containing third complex; and

18                   (j) differentiating ~~no/mild liver fibrosis from moderate/severe liver fibrosis~~ F0-  
19 F1 fibrosis from F2-F4 fibrosis in said individual based on the amounts of  $\alpha$ 2-MG, HA and  
20 TIMP-1-containing complexes.

1                   **32.**     (Currently amended) A method of monitoring the efficacy of anti-fibrotic  
2 therapy in a patient, comprising the steps of:

3                   (a) detecting  $\alpha$ 2-macroglobulin ( $\alpha$ 2-MG) in a sample from a patient administered  
4 an anti-fibrotic therapy;

5                   (b) detecting hyaluronic acid (HA) in a sample from said patient;

6                   (c) detecting tissue inhibitor of metalloproteinases-1 (TIMP-1) in a sample from  
7 said patient; and

8                   (d) determining the presence or severity of liver fibrosis in said patient based on  
9 the presence or level of  $\alpha$ 2-MG, HA and TIMP-1, thereby monitoring the efficacy of anti-fibrotic  
10 therapy.

1                   **33.**     (Original) The method of claim 32, further comprising comparing the  
2 presence or severity of liver fibrosis determined in step (d) to the presence or severity of liver  
3 fibrosis in said patient at an earlier time.

1                   **34.**     (Original) The method of claim 32, comprising detecting at most three  
2 markers of fibrosis.

1                   **35.**     (Original) The method of claim 32, further comprising detecting in a  
2 sample from said patient at least one marker selected from the group consisting of: PIINP,  
3 laminin, tenascin, collagen type IV, collagen type VI, YKL-40, MMP-3, MMP-2, MMP-  
4 9/TIMP-1 complex, sFas ligand, TGF- $\beta$ 1, IL-10, apoA1, apoA2, and apoB.

1                   **36.**     (Original) The method of claim 32, wherein step (a) comprises  
2 determining the level of  $\alpha$ 2-MG protein in said sample.

1                   **37.**     (Original) The method of claim 36, wherein the level of  $\alpha$ 2-MG  
2 protein is determined using one or more anti- $\alpha$ 2-MG antibodies.

1                   **38.**     (Original) The method of claim 32, wherein step (b) comprises  
2 determining the level of HA in said sample.

1                   39.     (Original) The method of claim 38, wherein the level of HA is determined  
2     using one or more HA-binding proteins.

1                   40.     (Original) The method of claim 32, wherein step (c) comprises  
2     determining the level of TIMP-1 protein in said sample.

1                   41.     (Original) The method of claim 40, wherein the level of TIMP-1 protein  
2     is determined using one or more anti-TIMP-1 antibodies.

1                   42.     (Currently amended) A method of differentiating ~~no/mild liver fibrosis~~  
2     ~~from moderate/severe liver fibrosis~~ F0-F1 fibrosis from F2-F4 fibrosis in an individual,  
3     comprising the steps of:

4                         (a) determining an  $\alpha$ 2-MG level in a sample from said individual;

5                         (b) determining a HA level in a sample from said individual;

6                         (c) determining a TIMP-1 level in a sample from said individual; and

7                         (d) diagnosing said individual as having ~~no/mild liver fibrosis~~ F0-F1 fibrosis  
8     when said  $\alpha$ 2-MG level is below an  $\alpha$ 2-MG cut-off value X1, said HA level is below a HA cut-  
9     off value Y1 or said TIMP-1 level is below a TIMP-1 cut-off value Z1,

10                        diagnosing said individual as having ~~moderate/severe liver fibrosis~~ F2-F4  
11     fibrosis when said  $\alpha$ 2-MG level is above an  $\alpha$ 2-MG cut-off value X2, said HA level is above a  
12     HA cut-off value Y2 and said TIMP-1 level is above a TIMP-1 cut-off value Z2,

13                        and diagnosing ~~remaining individuals~~ said individual as having an indeterminate  
14     status when said  $\alpha$ 2-MG level is above X1, said HA level is above Y1, and said TIMP-1 level is  
15     above Z1 but said  $\alpha$ 2-MG level is below X2, said HA level is below Y2 or said TIMP-1 level is  
16     below Z2.

1                   43.     (Original) The method of claim 42, wherein said individual has a disorder  
2     selected from the group consisting of viral hepatitis, autoimmune liver disease, alcoholic liver  
3     disease, fatty liver disease and drug-induced liver disease.

1                   44.     (Original) The method of claim 43, wherein said individual is infected  
2 with hepatitis C virus.

1                   45.     (Original) The method of claim 42, wherein said samples are  
2 independently selected from the group consisting of blood, serum, plasma, urine, saliva and liver  
3 tissue.

1                   46.     (Currently amended) The method of claim 45, wherein said  $\alpha 2$ -MG[[,]]  
2 level, HA level and TIMP-1 level each is determined in a serum sample.

1                   47.     (Original) The method of claim 46,  
2 wherein X1 is a value between 1.8 and 2.2 mg/ml;  
3 wherein Y1 is a value between 31 and 39 ng/ml;  
4 wherein Z1 is a value between 900 and 1100 ng/ml;  
5 wherein X2 is a value between 1.8 and 2.2 mg/ml;  
6 wherein Y2 is a value between 54 and 66 ng/ml; and  
7 wherein Z2 is a value between 1415 and 1735 ng/ml.

1                   48.     (Original) The method of claim 47,  
2 wherein X1=2.0 mg/ml;  
3 wherein Y1=35 ng/ml;  
4 wherein Z1 =1000 ng/ml;  
5 wherein X2=2.0 mg/ml;  
6 wherein Y2=60 ng/ml; and  
7 wherein Z2=1575 ng/ml.

1                   49.     (Original) The method of claim 47,  
2 wherein X1=2.0 mg/ml;  
3 wherein Y1=37 ng/ml;  
4 wherein Z1=1100 ng/ml;

wherein X2=2.0 mg/ml;  
wherein Y2=60 ng/ml; and  
wherein Z2=1575 ng/ml.

50. (Currently amended) The method of claim 42, wherein, ~~in a population having up to 30% liver fibrosis prevalence, at least 65% of individuals in said population are diagnosed as having no/mild fibrosis or moderate/severe fibrosis with an accuracy of at least 80%~~ in a population having up to 30% liver fibrosis prevalence, X1, Y1, Z1, X2, Y2, and Z2 are independently selected to differentiate F0-F1 fibrosis from F2-F4 fibrosis in said individual with at least about 80% accuracy in at least 65% of the population assayed.

51. (Currently amended) The method of claim 42, wherein, ~~in a population having up to 30% liver fibrosis prevalence, at least 65% of individuals in said population are diagnosed as having no/mild fibrosis or moderate/severe fibrosis with an accuracy of at least 90%~~ in a population having up to 30% liver fibrosis prevalence, X1, Y1, Z1, X2, Y2, and Z2 are independently selected to differentiate F0-F1 fibrosis from F2-F4 fibrosis in said individual with at least about 90% accuracy in at least 65% of the population assayed.

52. (Currently amended) The method of claim 42, wherein, ~~in a population having up to 30% liver fibrosis prevalence, at least 65% of individuals in said population diagnosed as having no/mild fibrosis or moderate/severe fibrosis with a positive predictive value of at least 90% and a negative predictive value of at least 90%~~ in a population having up to 30% liver fibrosis prevalence, X1, Y1, Z1, X2, Y2, and Z2 are independently selected to achieve a positive predictive value of at least 90% or a negative predictive value of at least 90% for differentiating F0-F1 fibrosis from F2-F4 fibrosis in at least 65% of the population assayed.

53. (Currently amended) The method of claim 42, wherein, ~~in a population having up to 10% liver fibrosis prevalence, at least 70% of individuals in said population are diagnosed as having no/mild fibrosis or moderate/severe fibrosis with an accuracy of at least 90%~~ in a population having up to 10% liver fibrosis prevalence, X1, Y1, Z1, X2, Y2, and



5 Z2 are independently selected to differentiate F0-F1 fibrosis from F2-F4 fibrosis in said  
6 individual with at least about 90% accuracy in at least 70% of the population assayed.

1           54. (Currently amended) A method of diagnosing the presence or severity of  
2 liver fibrosis in an individual, comprising the steps of:

3           (a) comparing a level of a first fibrotic marker ~~X~~  $\alpha$ 2-MG in said individual to a  
4 cut-off value X1 to determine whether said individual is positive for ~~said first fibrotic marker~~  
5 ~~X~~  $\alpha$ 2-MG;

6           (b) comparing a level of a second fibrotic marker ~~Y~~ HA in said individual to a  
7 cut-off value Y1 to determine whether said individual is positive for ~~said second fibrotic~~  
8 ~~marker Y~~ HA; and

9           (c) diagnosing the presence or severity of liver fibrosis in said individual based on  
10 positivity or negativity for ~~X and Y, wherein, in a population with up to 40% fibrosis~~  
11 ~~prevalence, at least 65% of individuals in said population are diagnosed with an accuracy~~  
12 ~~of at least 90%~~  $\alpha$ 2-MG and HA,

13           wherein in a population having up to 60% liver fibrosis prevalence, X1 and Y1  
14 are independently selected, to diagnose the presence or severity of liver fibrosis in said  
15 individual with at least about 70% accuracy.

1           55. (Currently amended) The method of claim 54, further comprising (d)  
2 comparing a level of a third fibrotic marker Z in said individual to a cut-off value Z1 to  
3 determine whether said individual is positive for said third fibrotic marker Z; and (e) diagnosing  
4 the presence or severity of liver fibrosis in said individual based on positivity or negativity for ~~X,~~  
5 ~~Y and Z~~  $\alpha$ 2-MG, HA, and Z,

6           wherein in a population having up to 60% liver fibrosis prevalence, X1, Y1, and  
7 Z1 are independently selected to diagnose the presence or severity of liver fibrosis in said  
8 individual within at least about 70% accuracy.

1           56. (Original) The method of claim 55, wherein said first fibrotic marker is  
2  $\alpha$ 2-MG, said second fibrotic marker is HA, and said third fibrotic marker is TIMP-1.

1                   57.     (Original) The method of claim 55, wherein the levels of at least three  
2     fibrotic markers are compared.

1                   58.     (Original) The method of claim 55, wherein the levels of three fibrotic  
2     markers are compared.

1                   59.     (Original) The method of claim 55, wherein the levels of at least four  
2     fibrotic markers are compared.

1                   60.     (Original) The method of claim 55, wherein the levels of at least five  
2     fibrotic markers are compared.

1                   61.     (Currently amended) The method of claim 54, wherein said diagnosis  
2     differentiates ~~no or mild liver fibrosis from moderate to severe liver fibrosis~~ F0-F1 fibrosis  
3     from F2-F4 fibrosis.

1                   62.     (Currently amended) The method of claim 54 or claim 61, wherein, ~~in a~~  
2     ~~population with up to 30% fibrosis prevalence, at least 65% of individuals in said~~  
3     ~~population are diagnosed with an accuracy of at least 93%~~ the accuracy of diagnosing the  
4     presence or severity of liver fibrosis in said individual is at least about 80%.

1                   63.     (Currently amended) The method of claim 54 or claim 61, wherein, ~~in a~~  
2     ~~population with up to 20% fibrosis prevalence, at least 70% of individuals in said~~  
3     ~~population are diagnosed with an accuracy of at least 94%~~ said population has up to 20%  
4     liver fibrosis prevalence.

1                   64.     (Canceled)

1                   65.     (Currently amended) A method of diagnosing the presence or severity of  
2     liver fibrosis in an individual, comprising the steps of:

3 (a) comparing a level of a first fibrotic marker ~~X~~  $\alpha$ 2-MG in said individual to a  
4 cut-off value X1 to determine whether said individual is positive for ~~said first fibrotic marker~~  
5 ~~X~~  $\alpha$ 2-MG;

6 (b) comparing a level of a second fibrotic marker ~~Y~~ HA in said individual to a  
7 cut-off value Y1 to determine whether said individual is positive for ~~said second fibrotic~~  
8 ~~marker Y~~; and ~~HA~~;

9 (c) comparing a level of a third fibrotic marker TIMP-1 in said individual to a cut-  
10 off value Z1 to determine whether said individual is positive for TIMP-1; and

11 (d) diagnosing the presence or severity of liver fibrosis in said individual based on  
12 positivity or negativity for ~~X and Y~~  $\alpha$ 2-MG, HA, and TIMP-1,

13 wherein said cut-off values ~~X1 and Y1 are optimized individually to give a~~  
14 ~~desired performance characteristic~~ X1, Y1, and Z1 are independently selected to achieve an  
15 optimized clinical parameter selected from the group consisting of sensitivity, specificity,  
16 negative predictive value, positive predictive value, and accuracy.

1 66. (Canceled)

1 67. (Canceled)

1 68. (Original) The method of claim 65, wherein said cut-off values are  
2 optimized using design of experiments (DOE) analysis.

1 69. (Original) The method of claim 66, wherein the levels of at least three  
2 fibrotic markers are compared.

1 70. (Original) The method of claim 66, wherein the levels of three fibrotic  
2 markers are compared.

1 71. (Currently amended) The method of claim 65, wherein said diagnosis  
2 differentiates ~~no or mild liver fibrosis from moderate to severe liver fibrosis~~ F0-F1 fibrosis  
3 from F2-F4 fibrosis.

1           72.     (Currently amended) A method of diagnosing the presence or severity of  
2 liver fibrosis in an individual, comprising the steps of:

3                   (a) comparing a level of a first fibrotic marker ~~X~~  $\alpha$ 2-MG in said individual to two  
4 cut-off values X1 and X2 to determine whether said individual is positive for ~~said first fibrotic~~  
5 ~~marker X~~  $\alpha$ 2-MG, wherein said individual is positive for  $\alpha$ 2-MG when said level of  $\alpha$ 2-MG is  
6 above X1 and X2;

7                   (b) comparing a level of a second fibrotic marker ~~Y~~ HA in said individual to two  
8 cut-off values Y1 and Y2 to determine whether said individual is positive for ~~said second~~  
9 ~~fibrotic marker Y~~ HA, wherein said individual is positive for HA when said level of HA is  
10 above Y1 and Y2; and

11                   (c) comparing a level of a third fibrotic marker TIMP-1 in said individual to two  
12 cut-off values Z1 and Z2 to determine whether said individual is positive for TIMP-1, wherein  
13 said individual is positive for TIMP-1 when said level of TIMP-1 is above Z1 and Z2; and

14                   (d) diagnosing the presence or severity of liver fibrosis in said individual based on  
15 positivity or negativity for ~~X and Y~~  $\alpha$ 2-MG, HA, and TIMP-1, wherein said cut-off values ~~X1,~~  
16 ~~Y1, X2 and Y2 are optimized individually to give a desired performance characteristic X1,~~  
17 Y1, Z1, X2, Y2, and Z2 are independently selected to achieve an optimized clinical parameter  
18 selected from the group consisting of sensitivity, specificity, negative predictive value, positive  
19 predictive value, and accuracy.

1           73.     (Canceled)

1           74.     (Currently amended) The method of claim ~~73~~ 72, wherein said cut-off  
2 values are optimized using design of experiments (DOE) analysis.